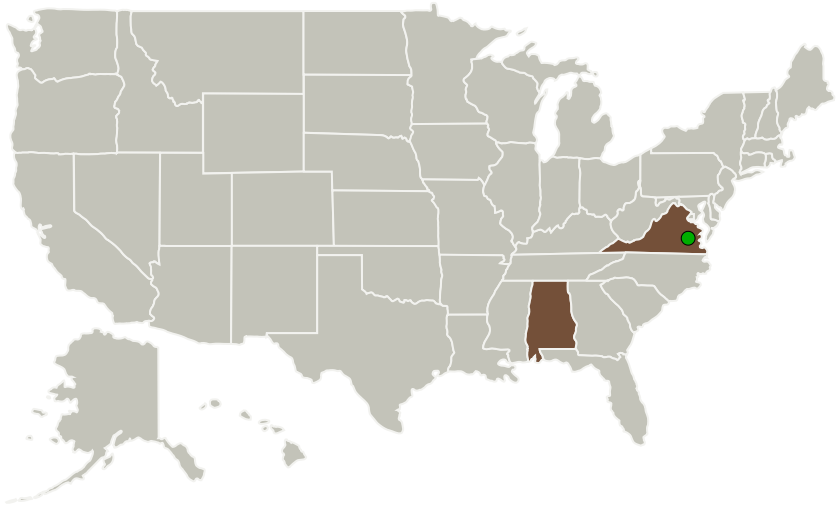
Application of Advanced Radiation Shielding Materials to Inflatable Structures, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

This innovation is a weight-optimized, inflatable structure that incorporates radiation shielding materials into its construction, for use as a habitation module or rover vehicle. An inflatable fabric enclosure can provide better radiation protection than an aluminum structure (which generates harmful secondary radiation). The proposed inflatable structure represents a hybrid restraint system in which a gas-impervious cloth barrier is structurally reinforced using an external grid of cordage. This hybrid design is based upon the premise that materials providing the surface coverage and impermeability necessary for fluid containment are ill-suited to withstand global pressure and mass loads, and vice versa. Segregating material roles enables significant weight reduction while satisfying stringent requirements for strength, dimensional stability, abrasion and impact resistance, and thermal control of the interior volume.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Tec-Masters, Inc.	Lead Organization	Industry Minority-Owned Business, Small Disadvantaged Business (SDB), Historically Underutilized Business Zones (HUBZones)	Huntsville, Alabama
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Alabama	Virginia

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138818)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Tec-Masters, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

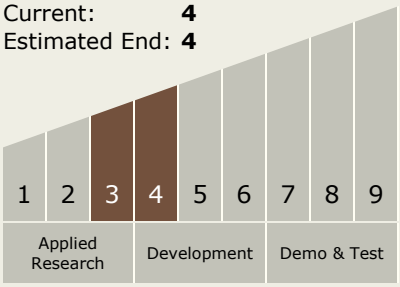
Carlos Torrez

Principal Investigator:

Barry F Battista

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.7 Special Materials

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System